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PARK, VAUGHAN & FLEMING LLP  
508 SECOND STREET  
SUITE 201  
DAVIS, CA 95616

EXAMINER

HWANG, JOON H

ART UNIT PAPER NUMBER

2172

DATE MAILED: 08/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/920,789

Applicant(s)

WANG ET AL.

Examiner

Joon H. Hwang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3</u> . | 6) <input type="checkbox"/> Other: _____  |

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### DETAILED ACTION

1. The pending claims are 1-46.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-8, 10, 12-15, 17, 19-21, 23, 30-32, 34, 36, 38, 40-42, and 44-46 are rejected under 35 U.S.C. 102(b) as being anticipated by Henninger et al. (U.S. Patent No. 5,499,371).

With respect to claim 1, Henninger discloses managing object to relational one-to-many mapping for an object model mapped to a relational database (line 55 in col. 2 thru line 25 in col. 3 and fig. 1). Henninger discloses obtaining, for a source object having a primary key value and being manipulated in a corresponding source table of the relational database, mapping meta-data (transform and object model) including information of a corresponding target table for storing at least one target object with which the source object has a one-to-many relationship of privately owned type and information of a foreign key of the corresponding target table (lines 9-26 in col. 7, line 60 in col. 9 thru line 22 in col. 10, and fig. 5). Henninger discloses generating an instruction to manipulate the at least one target object in the corresponding target table based on the

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mapping meta-data (line 26 in col. 9 thru line 67 in col. 10 and fig. 3). Henninger discloses manipulating the at least one target object in the database by executing the instruction on the database (line 26 in col. 9 thru line 67 in col. 10 and fig. 3).

With respect to claim 2, Henninger discloses generating an instruction to insert, read, delete or update the each target object in the database (line 26 in col. 9 thru line 67 in col. 10 and fig. 3).

With respect to claim 3, Henninger teaches each target object in the object model does not contain information regarding the one-to-many relationship (lines 9-26 in col. 7, line 26 in col. 9 thru line 67 in col. 10, fig. 3, and fig. 5).

With respect to claim 4, Henninger teaches performing the generating step and manipulating step on each target object with which the source object has the one-to-many relationship of the privately owned type (lines 9-26 in col. 7, line 26 in col. 9 thru line 67 in col. 10, fig. 3, and fig. 5).

With respect to claim 5, Henninger teaches carrying out the obtaining step when a system performing the method is initialized (lines 9-26 in col. 7, line 26 in col. 9 thru line 67 in col. 10, fig. 3, and fig. 5).

With respect to claim 6, Henninger discloses managing object to relational one-to-many mapping for an object model mapped to a relational database (line 55 in col. 2 thru line 25 in col. 3 and fig. 1). Henninger discloses obtaining, for a source object having a primary key value and being inserted in a corresponding source table of the relational database, mapping meta-data (transform and object model) including information of a corresponding target table for storing at least one target object with which the source object has a one-to-many relationship of

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privately owned type and information of a foreign key of the corresponding target table (lines 9-26 in col. 7, line 60 in col. 9 thru line 22 in col. 10, and fig. 5).

Henninger discloses generating an insert (create) instruction to add a value of the foreign key based on the primary key value of the source object, and to insert the at least one target object into the corresponding target table based on the mapping meta-data (line 26 in col. 9 thru line 67 in col. 10, fig. 3, and fig. 5).

Henninger discloses inserting (creating) the at least one target object into the database by executing the insert instruction on the database (line 26 in col. 9 thru line 67 in col. 10, fig. 3, and fig. 5).

With respect to claim 7, Henninger teaches building a database row representation of each target object containing target object data, adding the primary key value of the source object to the database row representation, generating the insert instruction based on the database row representation and the target object data using the mapping meta-data, writing the target object in a row of the corresponding target table by executing the insert instruction on the database, and repeating the above steps for each target object using the mapping meta-data (line 26 in col. 9 thru line 67 in col. 10, fig. 3, and fig. 5).

With respect to claim 8, Henninger teaches adding the primary key value of the source object as a foreign key value of the target object (line 26 in col. 9 thru line 67 in col. 10, fig. 3, and fig. 5).

With respect to claim 10, Henninger discloses storing the mapping meta-data external to the source object class and the target object classes (lines 9-26 in col. 7, line 26 in col. 9 thru line 67 in col. 10, fig. 1, fig. 3, and fig. 5).

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With respect to claim 12, Henninger discloses reading the source object from the object model and inserting the source object into the corresponding source table in the database (line 26 in col. 9 thru line 67 in col. 10, fig. 3, and fig. 5).

With respect to claim 13, Henninger discloses managing object to relational one-to-many mapping for an object model mapped to a relational database (line 55 in col. 2 thru line 25 in col. 3 and fig. 1). Henninger discloses obtaining, when a source object having a primary key value is being read from a source table in the relational database, mapping meta-data (transform and object model) including information of a corresponding target tables and information of one or more foreign keys of the corresponding target table (lines 9-26 in col. 7, line 1 in col. 11 thru line 46 in col. 12, and fig. 6). Henninger discloses generating a select instruction to select from the target tables target objects with which the source object has one-to-many relationships of privately owned type, based on the mapping meta-data and the primary key value of the source object (line 1 in col. 11 thru line 46 in col. 12 and fig. 6). Henninger discloses reading the target objects and relationships relating to the source object from the database by executing the select instruction on the database (line 1 in col. 11 thru line 46 in col. 12 and fig. 6).

With respect to claim 14, Henninger teaches querying for rows in the target tables that have a foreign key value matching the primary key value of the source object by executing the select instruction on the database, translating the queried rows into target objects based on the mapping metadata, adding the

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target objects to a collection that represents a value of relationship of the source object, the value of relationship referencing to the target objects, and setting the value of the relationship into the source object (line 1 col. 11 thru line 46 in col. 12 and fig. 6).

With respect to claim 15, Henninger teaches generating a select instruction to check foreign key fields in the target tables (line 1 col. 11 thru line 46 in col. 12 and fig. 6).

With respect to claim 17, Henninger discloses storing the mapping meta-data external to the source object class and the target object classes (lines 9-26 in col. 7, line 26 in col. 9 thru line 67 in col. 10, fig. 1, fig. 3, and fig. 5).

With respect to claim 19, Henninger discloses managing object to relational one-to-many mapping for an object model mapped to a relational database (line 55 in col. 2 thru line 25 in col. 3 and fig. 1). Henninger discloses obtaining, when a source object having a primary key value is being deleted from a source table in the relational database, mapping meta-data (transform and object model) that defines one or more corresponding target tables storing target objects with which the source object has one-to-many relationships of privately owned type and foreign key information (lines 9-26 in col. 7, line 10 in col. 14 thru line 23 in col. 15, and fig. 8). Henninger discloses generating a delete instruction to delete the target objects from the target tables based on the mapping meta-data (line 10 in col. 14 thru line 23 in col. 15 and fig. 8). Henninger discloses deleting the target objects by executing the delete instruction on the database (line 10 in col. 14 thru line 23 in col. 15 and fig. 8).

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With respect to claim 20, Henninger teaches generating a single delete instruction that deletes all rows from the target table that have foreign key matching the primary key of the source object when the target object are determined to be stored in a single target table (line 10 in col. 14 thru line 23 in col. 15 and fig. 8).

With respect to claim 21, Henninger teaches extracting a primary key value of for each target object, generating a delete instruction to delete each row with the primary key value, and repeating the extracting step and the generating step when the target objects are determined to be stored in multiple target tables (line 10 in col. 14 thru line 23 in col. 15 and fig. 8).

With respect to claim 23, Henninger discloses storing the mapping meta-data external to the source object class and the target object classes (lines 9-26 in col. 7, line 26 in col. 9 thru line 67 in col. 10, fig. 1, fig. 3, and fig. 5).

The limitations of claim 30 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

With respect to claim 31, Henninger discloses generating insert instructions to insert the multiple target objects into the corresponding target tables based on the mapping meta-data when a source object is inserted into the database (lines 9-26 in col. 7, line 26 in col. 9 thru line 67 in col. 10, fig. 3, and fig. 5).

With respect to claim 32, Henninger teaches building a database row representation for each target object and adding the primary key value of the



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source object to the database row representation (line 26 in col. 9 thru line 67 in col. 10, fig. 3, and fig. 5).

With respect to claim 34, Henninger discloses generating read instructions to read the multiple target objects and the relationship from the corresponding target tables and the foreign key values based on the mapping meta-data when a source object is read from the database (lines 9-26 in col. 7, line 1 in col. 11 thru line 46 in col. 12, and fig. 6).

With respect to claim 36, Henninger discloses generating delete instructions to delete the multiple target objects and the relationship from the corresponding target tables and the foreign key values based on the mapping meta-data when a source object is deleted from the database (lines 9-26 in col. 7, line 10 in col. 14 thru line 23 in col. 15, and fig. 8).

With respect to claim 38, Henninger teaches generating update instructions to track changes to the multiple target objects and the relationship, and to update the database when a source object is changed in the database (line 47 in col. 12 thru line 9 in col. 14 and fig. 7).

The limitations of claim 40 are rejected in the analysis of claim 1 above, and the claim is rejected on that basis.

The limitations of claim 41 are rejected in the analysis of claims 1 and 4 above, and the claim is rejected on that basis.

With respect to claim 42, Henninger discloses storing the mapping meta-data external to the source object class and the target object classes (lines 9-26 in col. 7, line 26 in col. 9 thru line 67 in col. 10, fig. 1, fig. 3, and fig. 5).

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The limitations of claims 44-46 are rejected in the analysis of claim 1 above, and these claims are rejected on that basis.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 9, 16, 22, 33, 35, 37, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henninger et al. (U.S. Patent No. 5,499,371) in view of Srinivasan (U.S. Patent No. 5,799,309).

With respect to claim 9, Henninger discloses the claimed subject matter as discussed above except the insert instruction as a SQL statement. However, Srinivasan discloses generating a SQL statement from an object-oriented query of an object-oriented application to a relational database query (abstract, line 58 in col. 1 thru line 19 in col. 2, and fig. 12). Therefore, based on Henninger in view of Srinivasan, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teaching of Srinivasan to the system of Henninger for SQL in order to command to a relational database as one way of computing language.

The limitations of claims 16, 22, 33, 35, 37, and 39 are rejected in the analysis of claim 9 above, and these claims are rejected on that basis.

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6. Claims 11, 18, 24, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henninger et al. (U.S. Patent No. 5,499,371) in view of Nicholson et al. (U.S. Patent No. 6,631,519).

With respect to claim 11, Henninger discloses the claimed subject matter as discussed above except storing the mapping meta-data (transform and object model) as XML files. However, Nicholson discloses a schema can be expressed in XML (lines 56-60 in col. 5 and lines 35-59 in col. 1) for compatibility of a system. Therefore, based on Henninger in view of Nicholson, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teaching of Nicholson to the system of Henninger for a schema data in XML for compatibility of a system.

The limitations of claims 18, 24, and 43 are rejected in the analysis of claim 11 above, and these claims are rejected on that basis.

7. Claims 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henninger et al. (U.S. Patent No. 5,499,371) in view of Imamura (U.S. Patent No. 5,560,014), and further in view of Ng et al. (U.S. Patent No. 6,385,618).

With respect to claim 25, Henninger discloses managing object to relational one-to-many mapping for an object model mapped to a relational database (line 55 in col. 2 thru line 25 in col. 3 and fig. 1). Henninger discloses writing a code (a query) to update a relational database based on a routine to

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update an object in an object-oriented application and a code to update the object-oriented application based on a completion of such update (the update transaction) to the relational database (line 47 in col. 12 thru line 9 in col. 14 and fig. 7). Henninger also discloses the object-oriented application will not be updated if the relational database update fails (lines 59-63 in col. 13) in order to ensure data consistency. These teach update information is maintained in the system of Henninger. Henninger does not explicitly disclose creating a clone of an object. However, Imaumura discloses creating a clone of an object, so that a modification to an object can be made without affecting other data in the system and for a modification history (abstract, line 50 in col. 1 thru line 19 in col. 2, and lines 14-30 in col. 4). Therefore, based on Henninger in view of Imaumura, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teachings of Imaumura to the system of Henninger for cloning an object in order to make a modification to an object without affecting other data in the system and for a modification history.

Henninger and Imaumura do not explicitly disclose determining changes by comparing two versions of an object. However, Ng discloses comparing an original data structure with a modified/updated data structure in order to isolate changes or modifications made to the original data structure (lines 42-51 in col. 3, lines 32-54 in col. 4, lines 40-46 in col. 7, line 19 in col. 8 thru line 20 in col. 9, and fig. 5). Therefore, based on Henninger in view of Imaumura, and further in view of Ng, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teachings of Ng to the system of

Henninger for comparing two versions of an object in order to isolate changes or modifications of an original version of the object.

With respect to claim 26, Ng further teaches determining which objects have been added, removed, or changed in the relationship using mapping meta-data including information of corresponding source table, one or more target tables and foreign keys of the target tables, generating an insert instruction for each target object of a source target that has been added, generating a delete instruction for each target object of a source target that has been removed, and generating an update instruction for each target object of a source target that has been changed (lines 42-51 in col. 3, lines 32-54 in col. 4, lines 40-46 in col. 7, line 19 in col. 8 thru line 42 in col. 9, fig. 5, and figs. 10-12). Therefore, the limitations of claim 26 are rejected in the analysis of claim 25 above, and the claim is rejected on that basis.

With respect to claim 27, Ng further discloses SQL for querying a relational database (lines 13-32 in col. 7). Therefore, the limitations of claim 27 are rejected in the analysis of claim 25 above, and the claim is rejected on that basis.

With respect to claim 28, Henninger discloses storing the mapping meta-data external to the source object class and the target object classes (lines 9-26 in col. 7, line 26 in col. 9 thru line 67 in col. 10, fig. 1, fig. 3, and fig. 5).

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Henninger et al. (U.S. Patent No. 5,499,371) in view of Imamura (U.S. Patent No.

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5,560,014) and Ng et al. (U.S. Patent No. 6,385,618), and further in view of Nicholson et al. (U.S. Patent No. 6,631,519).

With respect to claim 29, Henninger, Imamura, and Ng disclose the claimed subject matter as discussed above except storing the mapping meta-data (transform and object model) as XML files. However, Nicholson discloses a schema can be expressed in XML (lines 56-60 in col. 5 and lines 35-59 in col. 1) for compatibility of a system. Therefore, based on Henninger in view of Imamura and Ng, and further in view of Nicholson, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teaching of Nicholson to the system of Henninger for a schema data in XML for compatibility of a system.

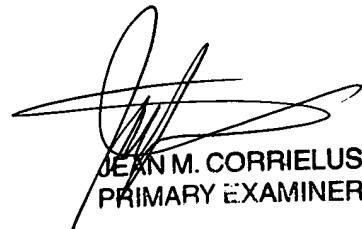
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joon H. Hwang whose telephone number is 703-305-6469. The examiner can normally be reached on 9:30-6:00(M~F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN E BREENE can be reached on 703-305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joon Hwang  
8/17/04



JERN M. CORRIELUS  
PRIMARY EXAMINER